

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued September 26, 1997

Decided January 30, 1998

No. 96-1251

AMERICAN LUNG ASSOCIATION, ET AL.,  
PETITIONERS

v.

ENVIRONMENTAL PROTECTION AGENCY AND  
CAROL M. BROWNER, ADMINISTRATOR, UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY,  
RESPONDENTS

APPALACHIAN POWER COMPANY, ET AL.,  
INTERVENORS

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Consolidated with

No. 96-1255

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On Petitions for Review of an Order of the  
Environmental Protection Agency

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*Robert E. Yuhnke* argued the cause for petitioners. With him on the briefs were *Christine L. Shaver* and *Howard I. Fox*.

*Karen L. Egbert*, Attorney, U.S. Department of Justice, argued the cause for respondents. With her on the brief were *Lois J. Schiffer*, Assistant Attorney General, and *Michael L. Goo*, Counsel, Environmental Protection Agency. *Gerald K. Gleason*, Counsel, entered an appearance.

*Andrea Bear Field*, *Henry V. Nickel*, *Linda C. Trees*, and *James R. Bieke* were on the brief for intervenor Appalachian Power Company, et al. *Ross S. Antonson* entered an appearance.

Before: EDWARDS, *Chief Judge*, GINSBURG and TATEL, *Circuit Judges*.

Opinion for the Court filed by *Circuit Judge* TATEL.

TATEL, *Circuit Judge*: On behalf of the nation's nearly nine million asthmatics, the American Lung Association and the Environmental Defense Fund challenge the Environmental Protection Agency's refusal to revise the primary national ambient air quality standards for sulfur dioxide (SO<sub>2</sub>). Declining to promulgate a more stringent national standard, the EPA Administrator concluded that the substantial physical effects experienced by some asthmatics from exposure to short-term, high-level SO<sub>2</sub> bursts do not amount to a public health problem. Because the Administrator failed adequately to explain this conclusion, we remand for further elucidation.

## I

Driven by its "deep concern for protection of the health of the American people," SEN. REP. NO. 91-1196, at 1 (1970) ("SENATE REPORT"), Congress enacted the Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (1970) (codified as amended at 42 U.S.C. §§ 7401-7671q (1994)), mandating a "massive attack on air pollution," SENATE REPORT at 1. As amended, the Clean Air Act erects a comprehensive system of national ambient air quality standards ("NAAQS")

to regulate health-threatening air pollutants. The statute defines primary NAAQS as "ambient air quality standards the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health." 42 U.S.C. § 7409(b)(1).

Once the EPA Administrator concludes that a pollutant "may reasonably be anticipated to endanger public health or welfare" and that it comes from "numerous or diverse mobile or stationary sources," *id.* § 7408(a)(1)(A)-(B), the Act requires the Administrator to produce "criteria," defined as the latest scientific data on "all identifiable effects on public health" caused by that pollutant. *Id.* § 7408(a)(2). Based on these comprehensive criteria and taking account of the "preventative" and "precautionary" nature of the act, *Lead Industries Ass'n, Inc. v. EPA*, 647 F.2d 1130, 1155 (D.C. Cir. 1980), the Administrator must then decide what margin of safety will protect the public health from the pollutant's adverse effects—not just known adverse effects, but those of scientific uncertainty or that "research has not yet uncovered." *Id.* at 1153. Then, and without reference to cost or technological feasibility, the Administrator must promulgate national standards that limit emissions sufficiently to establish that margin of safety. *See* 42 U.S.C. § 7409(b)(1); *American Petroleum Inst. v. Costle*, 665 F.2d 1176, 1181-82 (D.C. Cir. 1981) (describing NAAQS promulgation procedure); *Lead Industries*, 647 F.2d at 1148-50 (in establishing NAAQS, Congress deliberately subordinated economic and technological feasibility concerns to the achievement of public health goals). States bear primary responsibility for attaining, maintaining, and enforcing these standards. *See* 42 U.S.C. § 7410.

In its effort to reduce air pollution, Congress defined public health broadly. NAAQS must protect not only average healthy individuals, but also "sensitive citizens"—children, for example, or people with asthma, emphysema, or other conditions rendering them particularly vulnerable to air pollution. SENATE REPORT at 10; *Lead Industries*, 647 F.2d at 1152. If a pollutant adversely affects the health of these sensitive individuals, EPA must strengthen the entire national standard.

*Lead Industries*, 647 F.2d at 1153 (NAAQS "must be set at a level at which there is 'an absence of adverse effect' on [ ] sensitive individuals") (quoting SENATE REPORT at 10).

#### *Sulfur Dioxide and Asthmatics*

A highly reactive colorless gas smelling like rotten eggs, sulfur dioxide derives primarily from fossil fuel combustion. Best known for causing "acid rain," at elevated concentrations in the ambient air, SO<sub>2</sub> also directly impairs human health. As the Administrator explains in the Final Decision on review here, at concentrations above 2.0 parts per million ("ppm"), SO<sub>2</sub> can affect healthy nonasthmatic individuals; below 2.0 ppm, it primarily affects people with asthma. National Ambient Air Quality Standards for Sulfur Oxides (Sulfur Dioxide)—Final Decision, 61 Fed. Reg. 25,566, 25,570 (1996).

Following the passage of the Clean Air Act, EPA promulgated the SO<sub>2</sub> NAAQS in effect today. The primary standards consist of a 24-hour standard (0.14 ppm averaged over 24 hours not to be exceeded more than once a year) and an annual standard (0.03 ppm annual arithmetic mean). *Id.* at 25,568. EPA also established a "secondary" three-hour standard (0.50 ppm averaged over three hours not to be exceeded more than once a year), designed to protect the "public welfare" against non-health-related effects such as visibility impairment or environmental degradation, *see* 42 U.S.C. § 7409(b)(2). Petitioners do not challenge these existing standards.

Approximately four percent of the nation's population suffers from asthma. Characterized by bronchoconstriction—shortness of breath, coughing, wheezing, chest tightness, and sputum production—asthma is triggered by many different stimuli, including cold or dry air, exercise or pollen as well as airborne pollutants. The effects of bronchoconstriction can vary from short-term discomfort, such as an hour-long reaction with no lasting after-effects, to asthma attacks requiring medication or hospitalization. Although rare, death can result.

Sulfur dioxide induces bronchoconstriction in asthmatics, but only under certain conditions. To experience adverse effects from SO<sub>2</sub> concentrations below 1.0 ppm, asthmatics must be exposed for five minutes or longer while breathing quickly and heavily through both nose and mouth, the sort of breathing induced by light exercise, shoveling snow, climbing several flights of stairs, or jogging to catch a bus. At concentrations above 2.0 ppm, SO<sub>2</sub> causes adverse effects even if the exposure lasts less than five minutes or the asthmatic breathes regularly. *See* Second Addendum to Air Quality Criteria for Particulate Matter and Sulfur Oxides (1982): Assessment of Newly Available Health Effects Information (1986).

### *The Challenged Final Decision*

This case concerns the effect on asthmatics of what are known as high-level SO<sub>2</sub> bursts, defined as emissions of 0.50 ppm or more lasting at least five minutes. Occurring sporadically and from specific sources, SO<sub>2</sub> bursts come primarily from power utilities; the rest come from nonutility sources such as industrial boilers, petroleum refineries, pulp and paper mills, sulfuric acid plants, and aluminum smelters.

Citing the health concerns of asthmatics and relying on a 1977 amendment to the Clean Air Act, in which Congress ordered the Agency to review and revise all criteria and NAAQS by 1980 and at five-year intervals thereafter, 42 U.S.C. § 7409(d), petitioners urged EPA to issue a new NAAQS limiting short-term SO<sub>2</sub> bursts. Not until 1996, after petitioners sued twice to compel a decision, *see Environmental Defense Fund v. Thomas*, 870 F.2d 892 (2d Cir. 1989); *American Lung Ass'n v. Browner*, Civil Action No. 92-5316 (E.D.N.Y. Nov. 12, 1992), and after two rounds of public notice and comment, did EPA issue its final decision regarding SO<sub>2</sub> NAAQS. *See* NAAQS for Sulfur Oxides (Sulfur Dioxide)—Reproposal, 59 Fed. Reg. 58,958 (1994); Proposed Decision Not To Revise the National Ambient Air Quality Standards for Sulfur Oxides (Sulfur Dioxide), 53 Fed. Reg. 14,926 (1988). Rejecting petitioners' arguments, EPA con-

cluded not only that the annual and 24-hour primary standards needed no revision, but also that an additional five-minute standard was unnecessary to protect asthmatics. *See* Final Decision at 25,575-76.

In arriving at her final decision, the Administrator reviewed a decade of data on the extent of high-level short-term SO<sub>2</sub> bursts and their effects on public health. *See* Review of the National Ambient Air Quality Standards for Sulfur Oxides: Assessment of Scientific and Technical Information: Supplement to the 1986 OAQPS Staff Paper Addendum (Sept. 1994); Supplement to the Second Addendum (1986) to Air Quality Criteria for Particulate Matter and Sulfur Oxides (1982): Assessment of New Findings on Sulfur Dioxide Acute Exposure Health Effects in Asthmatic Individuals (Aug. 1994). Based on clinical studies of mild to moderate asthmatics, she found that when such individuals breathe rapidly while exposed to SO<sub>2</sub> concentrations of 0.60 ppm for five minutes, "substantial percentages ( $\geq$  25 percent)" experience effects "distinctly exceeding ... [the] typical daily variation in lung function" that asthmatics routinely experience. Final Decision at 25,572. The severity of these atypical effects, she found, "is likely to be of sufficient concern to cause disruption of ongoing activities, use of bronchodilator medication, and/or possible seeking of medical attention." *Id.*

The scientific community disagreed about the medical significance of these effects and whether they should be considered "adverse." Some experts took the position that such symptoms usually have no lasting impact, amounting at worst to a brief period of reversible discomfort; others argued that even a one-hour disruption of activity can amount to a worrisome adverse health effect. The Administrator left this dispute unresolved. Instead, she discerned in the medical debate a consensus, which she adopted, that "*repeated* occurrences of such effects should be regarded as significant from a public health standpoint." *Id.* at 25,573 (emphasis added).

The Administrator then discussed the three exposure analyses on which the 1994 version of the proposed rule rested.

These studies estimated that from 180,000 to 395,000 "exposure events"—defined as a heavily breathing asthmatic exposed to an SO<sub>2</sub> burst—occur annually, affecting from 68,000 to 166,000 asthmatic individuals. *Id.* at 25,574. In view of the Administrator's previous finding, reiterated by agency counsel at oral argument, that at least 25 percent of asthmatics experience atypical effects from exposure events, these data suggest that as many as 41,500 ( $\geq$  25 percent of 166,000) asthmatics experience atypical effects from repeated SO<sub>2</sub> bursts each year. At the same time, the Administrator acknowledged that subsequent industry studies of four non-utility sources suggest that the 1994 studies may have overestimated exposure for certain SO<sub>2</sub> sources, *id.*, meaning that the number of affected asthmatics could be lower. The Administrator did not resolve the conflict between the studies.

Armed with all these data, the Administrator concluded that "the likelihood that asthmatic individuals will be exposed ... is very low when viewed from a national perspective," that "5-minute peak SO<sub>2</sub> levels do not pose a broad public health problem when viewed from a national perspective," and that "short-term peak concentrations of SO<sub>2</sub> do not constitute the type of ubiquitous public health problem for which establishing a NAAQS would be appropriate." *Id.* at 25,575. Describing SO<sub>2</sub> bursts as "localized, infrequent and site-specific," she concluded that a new national standard was unnecessary. *Id.* The Administrator nevertheless decided to encourage individual states to address short-term high-level SO<sub>2</sub> emissions, initiating a rulemaking to provide appropriate guidance. Proposed Implementation Requirements for Reduction of Sulfur Oxide (Sulfur Dioxide) Emissions, 62 Fed. Reg. 210 (Jan. 2, 1997) ("Proposed State Guidelines Rulemaking") (soliciting public comment on proposed guidelines for state monitoring and regulation of five-minute peaks of SO<sub>2</sub>).

Petitioners now challenge the Administrator's decision declining to promulgate a new NAAQS. They assert that by failing to establish a five-minute NAAQS capping SO<sub>2</sub> emissions at 0.60 ppm, EPA has violated its statutory responsibility to protect the public health. We review the Administrator's decision pursuant to 42 U.S.C. § 7607(d)(9)(A)-(C)

("[C]ourt may reverse any such [agency] action found to be ... arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law; ... [or] in excess of statutory ... authority, or limitations....").

## II

Petitioners challenge much of the data the Administrator relied on, as well as the conclusions she drew. Generally speaking, we will not second-guess EPA in its area of special expertise. See *Natural Resources Defense Council v. United States EPA*, 824 F.2d 1146, 1163 (D.C. Cir. 1987) (en banc); *American Petroleum Institute*, 665 F.2d at 1184. Applying this deferential standard of review, we accept the Administrator's analysis of the exposure studies in the record, as well as the implication of her analysis—that thousands of asthmatics can be expected to react atypically to SO<sub>2</sub> bursts each year.

Petitioners contend that the Administrator's analysis amounts to a conclusive finding that SO<sub>2</sub> bursts adversely affect asthmatics' health, thus triggering her duty to promulgate a new NAAQS. See *Lead Industries*, 647 F.2d at 1153. At oral argument, counsel for EPA vigorously disputed petitioners' contention that the Administrator "found" an adverse health effect. As we read the record, agency counsel appears to be correct: The Administrator did not decide whether asthmatic reaction to SO<sub>2</sub> bursts—"disruption of ongoing activities, use of bronchodilator medication, and/or possible seeking of medical attention"—amounts to an adverse health effect or merely, as some medical experts argued, run-of-the-mill asthma symptoms indistinguishable from bronchodilation due to cold air or exercise. Final Decision at 25,572-73. Skipping this disputed question, the Administrator concluded that, regardless of the impact of single occurrences, "repeated occurrences of such effects should be regarded as significant from a public health standpoint." *Id.* at 25,573.

Disagreeing with this approach, petitioners argue that the Administrator *had* to answer the subsidiary "adverse effects" question, pointing to her warning to all states in the subse-



quent rulemaking that "[a]lthough these episodes are few, it is clear that 5-minute SO<sub>2</sub> ambient concentration peaks pose a health threat to sensitive exposed populations," Proposed State Guidelines Rulemaking at 211. We need not decide that issue at this time, however, because we think the Administrator has failed to explain the answer she did give, *i.e.*, that SO<sub>2</sub> bursts do not amount to a "public health" problem within the meaning of the Act. The link between this conclusion and the factual record as interpreted by EPA—that "repeated" exposure is "significant" and that thousands of asthmatics are exposed more than once a year—is missing. Why is the fact that thousands of asthmatics can be expected to suffer atypical physical effects from repeated five-minute bursts of high-level sulfur dioxide not a public health problem? Why are from 180,000 to 395,000 annual "exposure events" (the range indicated by the 1994 studies) or some fewer number (as suggested by the industry studies) so "infrequent" as to warrant no regulatory action? Why are disruptions of ongoing activities, use of medication, and hospitalization not "adverse health effects" for asthmatics? Answers to these questions appear nowhere in the administrative record.

In her only statement resembling an explanation for her conclusion that peak SO<sub>2</sub> bursts present no public health hazard, the Administrator characterizes the bursts as "localized, infrequent and site-specific." Final Decision at 25,575. But nothing in the Final Decision explains why "localized," "site-specific" or even "infrequent" events might nevertheless create a public health problem, particularly since, in some sense, all pollution is local and site-specific, whether spewing from the tailpipes of millions of cars or a few offending smoke stacks. From the record, we know that at least six communities experience "repeated high 5-minute peaks greater than 0.60 ppm SO<sub>2</sub>," *id.*, and agency counsel told us at oral argument that these so-called "hot spots" are not the only places where repeated exposure occurs. Nowhere, however, does the Administrator explain why these data amount to no more than a "local" problem.

Without answers to these questions, the Administrator cannot fulfill her responsibility under the Clean Air Act to establish NAAQS "requisite to protect the public health," 42 U.S.C. § 7409(b)(1), nor can we review her decision. Judicial deference to decisions of administrative agencies like EPA rests on the fundamental premise that agencies engage in reasoned decision-making. See *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*, 435 U.S. 519, 524-25, 544-45, 558 (1978); *SEC v. Chenery Corp.*, 332 U.S. 194, 209 (1947) (agency's experience, appreciation of complexities and policies, and responsible treatment of the facts "justifies the use of the administrative process"). With its delicate balance of thorough record scrutiny and deference to agency expertise, judicial review can occur only when agencies explain their decisions with precision, for "[i]t will not do for a court to be compelled to guess at the theory underlying the agency's action...." *SEC v. Chenery Corp.*, 332 U.S. at 196-97. Where, as here, Congress has delegated to an administrative agency the critical task of assessing the public health and the power to make decisions of national import in which individuals' lives and welfare hang in the balance, that agency has the heaviest of obligations to explain and expose every step of its reasoning. For these compelling reasons, we have always required the Administrator to "co-gently explain why [she] has exercised [her] discretion in a given manner." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 48 (1983).

In this case, the Administrator may well be within her authority to decide that 41,500 or some smaller number of exposed asthmatics do not amount to a public health problem warranting national protective regulation, or that three or six or twelve annual exposures present no cause for medical concern. But unless she describes the standard under which she has arrived at this conclusion, supported by a "[ ]plausible" explanation, *id.* at 43, we have no basis for exercising our responsibility to determine whether her decision is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law; ... [or] in excess of statutory ... authority, or limitations...." 42 U.S.C. § 7607(d)(9)(A)-(C).

Given the gaps in the Final Decision's reasoning, we must remand this case to permit the Administrator to explain her conclusions more fully. We therefore need not resolve the debate between the parties over whether the Clean Air Act authorizes the Administrator to decline to protect an identifiable group of asthmatics from a known adverse health effect. Although our cases make clear that the Administrator has broad discretion to establish an "adequate margin of safety" above and beyond what scientific certainty prescribes and to craft regulations that protect against unknown harms, *see Lead Industries*, 647 F.2d at 1153-55 (Administrator must "err on the side of caution" when establishing the margin of safety, even where the "medical significance [of the effects] is a matter of disagreement"), they do not necessarily establish the converse proposition—that the Administrator may decline to establish a margin of safety in the face of documented adverse health effects. Since in this case the Administrator has failed adequately to explain her conclusion that no public health threat exists, we can leave the issue of the scope of her authority for another day.

We remand this case to the agency for further proceedings consistent with this opinion.

*So ordered.*